

[pacvet] CSIRO develops new test for foot and mouth disease

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CSIRO develops new test for foot and mouth disease

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Researchers at the CSIRO's Australian Animal Health Laboratory have developed a new test for foot-and-mouth disease that involves no infectious viral material and can differentiate between infected and vaccinated animals.

This "DIVA" test could transform how foot-and-mouth disease is controlled in future because it's relatively inexpensive and does not require infectious virus to produce the reagents.

The British government decided against using vaccines to control a major outbreak in 2001 because the tests available to them could not distinguish between infected and vaccinated animals.

So, vaccinated animals would look like they were infected and would have to be treated in the same way. The outbreak was finally contained only after the slaughter of more than six million animals. Most were not infected.

"Our test is the first in the world to be built entirely from non-living materials produced in the laboratory," says Janine Muller, who developed the test with CSIRO colleagues while completing her PhD.

She is now a research scientist with the Victorian Department of Primary Industries.

"We have been able to build and manufacture the critical components of our test from the ground up. They are biochemical compounds that are not alive and can't become infectious.

"We unravelled the structure of an antibody to an important protein the virus injects into cells. They then generated its genetic template and used it to engineer the antibodies at the heart of the test."

Foot-and-mouth disease, a highly contagious viral infection, is considered the most economically devastating disease affecting farm animals worldwide.

It spreads rapidly and is a huge threat to trade. An outbreak in Australia would instantly shut down the meat and livestock export industry - the second largest in the world -and would cost between \$8 and \$13 billion in terms of lost production, trade and disease eradication.

The new test, which can pinpoint vaccinated animals, has application worldwide where costs of producing reagents is a critical factor. The test itself is not used for primary diagnosis but in the control and recovery phase where material being tested is highly unlikely to be of an infectious nature and testing can be carried out at a lower level of biocontainment.

The test itself is a faster and more sensitive way of detecting the disease in livestock.

"This work is a great example of practical research that can provide real benefits to an industry," says Terry Longhurst, strategic science manager at Meat and Livestock Australia which, together the Australian Biosecurity Co-operative Research Centre, funded the research.

Janine Muller is one of 16 early-career scientists presenting their research to the public for the first time thanks to Fresh Science, a national program sponsored by the Federal and Victorian Governments.
